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May, 1903.

THE AMERICAN

# X-RAY JOURNAL

A MONTHLY  
DEVOTED  
TO THE  
PRACTICAL  
APPLICATION  
OF THE  
NEW SCIENCE  
AND TO THE  
PHYSICAL  
IMPROVEMENT  
OF MAN.

CHICAGO, ILL.



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# THE AMERICAN X-RAY JOURNAL

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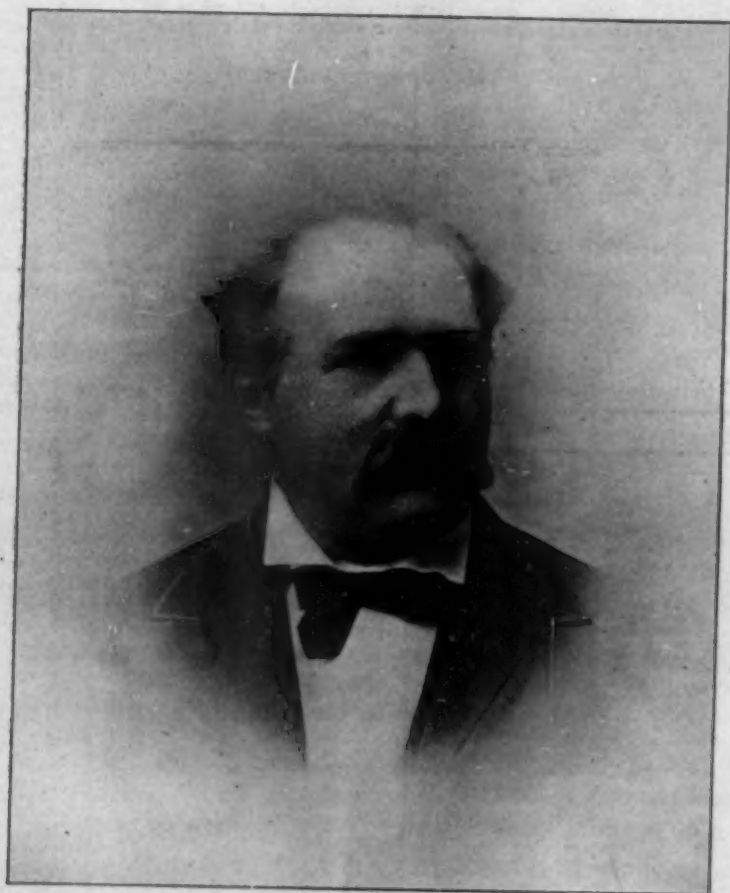
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ROBERT NEWMAN, M. D.

# THE AMERICAN X-RAY JOURNAL.

Devoted to Practical X-Ray Work and Allied Arts and Sciences.

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## The Anode Rays.

BY JOHN T. PITKIN, M. D.

Some eminent astronomers maintain that the force generated by the sun results from a stupendous bombardment of that orb by innumerable comets while in perihelium.

The force thus generated is beyond the range of the human eye; as are the Lenard or kathodal, the anodal, the ultra violet, the magnetic and the Roentgen rays.

This force or these forces traverse an expanse of rarified medium, a portion impinges on our atmosphere and we receive light, heat, magnetic and active rays.

Under excitation our mundane sphere presents a green or active and a dark or relatively inactive hemisphere.

Our 'greatest human teacher, Jesus Christ, taught in parables or by analogy. In my puerile effort to emulate His example I will liken the target or anode of the Jackson-Crookes tube to the solar globe, the contained kathode stream of hypo-microscopic particles which bombard the reflector to the comets of perihelium, the anode rays to the ulterior force from our little sun. As these rays strike upon one-half the glass wall of the tube (the analogue of the atmosphere) they are converted into light, heat and the actinic force known as the Roentgen ray.

The total strength, density, or number of lines of force in a given x-ray field depends upon the volume and number of

particles of matter in the anode stream, the volume is a function of the size of the tube employed; the number of particles is a function of the lowness of the vacuum plus an adequate current of electricity for its proper excitation.

Thus a tube eight inches in diameter presents four times as much glass surface for bombardment by the anode rays as another tube of but half its diameter, hence the volume of x-rays from the large tube will be four times as great.

All other conditions being equal, a static machine having forty revolving plates can energize twice as many particles of the anode stream as another apparatus having but twenty revolving plates.

As all normal x-ray fields are of the same general shape and have the same horizontal and vertical dimensions at a given distance from the target, the advantage of the large soft tube with an abundant electrical current back of it becomes obvious.

In shape the bundle of rays constituting the anode stream is hemispherical, its outer rounded surface terminates on the inner green wall of the (x-ray) active portion of the tube. This wall gives the anode rays their conformation and limitation.

At their source the area of their generation will be round, square, oblong, large, small, regular or irregular, depending upon the size, shape and integrity of the

free surface and edges of the reflector where they are formed from myriads of small particles of matter supplied to the target by the kathode stream.

From their area of generation the anode rays pass outward in straight lines diverging from each other. An imaginary plane taken in the direction of propagation will be fan-shaped. They are densest at the target and attenuated at the glass wall of limitation.

The velocity of the stream depends upon the degree of excitation of the tube; and its steadiness when normally excited, upon the nature of the electrical current which supplies it.

If from a static machine without spark gaps it will be perfectly uniform. If many spark gaps are used or an induction coil employed the anode rays will be rhythmic in quality but the fluctuations can not be detected by the sense of sight.

When the tube is (1) under or over-excited, (2) has too low or too high a vacuum for the electrical current that operates it, when (3) very many spark gaps are interposed in the electrical current so as to render it oscillatory, then the anode rays will be irregular, fitful and unreliable. Under these conditions they often encroach upon what is normally the dark or inactive hemisphere, the encroachment being symmetrical or asymmetrical: a symmetrical encroachment passing just over the normal equator of the tube, continuous or intermittent, or a wavering of the equatorial line between the normal and an excessive point signifies that the tube is either too high or over excited.

An oscillatory electrical current lights the two hemispheres alternately.

In the anode stream are metallic particles of platinum torn off from the target. These become implanted on the in-

side of the glass wall of the active hemisphere, causing a permanent bluish discoloration that serves as a register, informing the operator how much service a given tube has sustained.

For purposes of further investigation the field of the anode ray can be divided into conoid segments, whose apices rest upon the free edges and surface of the reflector, their bases upon the inner glass wall of the active hemisphere. The strength of any given conic segment of the field will depend upon the number of particles supplied to that portion of the target in an instant of time where its apex rests.

When the Lenard rays fall largely upon the outer circles of the target, that structure becomes red hot thruout! Then the anode cones near the equator of the tube are strong, but if the kathode stream is sharply focused upon the bull's eye as manifested by its taking on a white heat, the conic segments of the center of the anode field will be relatively intensified.

By the bombardment of the glass wall of the active hemisphere the glass thereof fluoresces green. The opacity of the color is proportionate to the density or strength of the anode rays on the one side of the glass wall and the x-rays upon the other side. The uniformity of color and the absence of all flickering testifies to their steadiness.

Born at the target, begotten of material and force obtained from a kathode parentage, the anode rays possess the traits of its antecedent force, such as volume, regularity or irregularity and velocity. These traits of quality and quantity with many others are in turn transmitted to its offspring, the X or Roentgen ray.

BUFFALO, N. Y.

## The Relationship of Psychic Suggestion to Electro-Therapeutics.\*

BY MAURICE FIESCHOR PILGRIM, PH. D., M. D.

If the sick have the inherent power to evolve a cure, what is the need of a physician? Why not leave Nature alone to do as she pleases, as in the case of all the lower orders of animals? We reply that if the injury or disease be of unusual acuity the natural reparative property requires stimulation in order to become available in time to prevent degenerative changes within the organism. The physician endeavors to put the ailing organism in such condition as to readily permit the needed remedial changes to take place. Can he at the same time stimulate by his treatment the *vis medicatrix* so that it shall operate with greater force in overcoming deviations from normal physiological functions? Undoubtedly he does so, but does he do it solely or mainly with his drugs or electricity? Are there not other if not more efficient means by which this may be and is accomplished? In my judgment, based on considerable observation and experience, much more can be accomplished in this direction by psychic suggestion in its varied methods of application, in combination with other appropriate treatment, than with either singly. This is believed to be a very temperate statement of a momentous fact and very much under-states the truth. Nevertheless, I have no desire to dogmatize nor claim what to the unprejudiced mind may seem extravagant, for I realize fully that the world has from time immemorial been cursed by attempts at making half-truths do the full duty of the whole truth.

Not very much is really known concerning this organic faculty—the *vis medica-*

*trix*—but it is evident that its energy is sometimes kinetic and at other times merely potential. It is very similar to the action of a watch: when the watch is wound the spring slowly uncoils and the hands move; but some obstruction is liable to clog its wheels at any moment and thus hold the power abeyant.

It is not my intention to attempt by argument to establish even a *prima facie* case for psychic suggestion as a curative agent. The only purpose of this paper is to indicate the value of this newly recognized force to the electro-therapist in connection with his work, and, incidentally, to appeal to my professional colleagues to investigate and rescue it from incompetent hands and place it where it rightfully belongs and where it should always have been—with the medical profession. While adhering to that purpose, I may with entire propriety remark that psychic force, like many other agencies of acknowledged potency, does not make its strongest appeal to the eye or ear or any of the physical senses.

The Crookes tube, for example, does not appeal powerfully to any of our mere physical senses. Visually considered it is not intense; it feebly appeals to the sense of touch, and is noiseless in operation; nevertheless it will penetrate the densest substance, disclosing the hitherto unseeable and unknowable. And more remarkable than all this is the fact that this light which so feebly appeals to our outward senses, is at this very time demonstrating its power in the direction of destructive metamorphoses. What the surgeon has been unable successfully to accomplish with his knife, is now being performed by this noiseless agent. The x-ray

\* Read at the meeting of the American Electro-Therapeutic Association, at the Hotel Kaaterskill, Catskill Mts., New York, September 4, 1901.

tube may fairly be said to have now brot the most malignant type of cancer with-in the classification of curable diseases. Still the question remains and recurs as to what the x-ray really is, and how these remarkable results are obtained. A recent writer, referring to the subject, says:

"In the x-ray we have a new and as yet imperfectly understood force, a new form of energy which is neither electricity nor light, although produced by one and closely related to the other."

And now we are hearing almost daily of new and successful experiments in wireless telegraphy and telephony which, considered from a material point of view, cannot and do not appeal to our physical senses or belief. The physical senses are not the only channels thru which we are made acquainted with the ceaseless unfoldings of the mysteries of that great cosmos in which we live, but of which we still know, comparatively, so little. Permit me to invoke for the psychic element in the treatment of disease something of that spirit of unbiased and reverent investigation that is being accorded to the recent developments in the realm of the more material sciences. Individual observation and experience must, after all, supply the strongest ground for belief here as well as elsewhere. In the beginning, however, reliance must to a considerable extent be placed upon the results of the investigations of others along a given line. Nor is such a course a radical departure from ordinary procedure. It is surely not asking an unusual or unreasonable concession. The whole pathway of electro-therapeutics has been illumined by the patient investigations and achievements of esteemed colleagues pioneering far in advance of us, whom we have felt it an honor and privilege to follow. Very much that is of value in electro-therapeutics today we owe to the labors of honored colleagues, many of them members of this Association.

Those mountebanks who endeavor to create the impression that a patient can expect nothing psychically unless all belief in the efficacy of every other form of treatment is absolutely and unreservedly renounced seem to me to reach the very consummation of absurdity. One of the leading physicians of Great Britain, the celebrated Dr. Tukey of London, has for years been treating his patients with drugs and psychic suggestion. He has found that the use of the one re-enforced the other, thus greatly enhancing his usefulness. In a personal interview three years ago he assured me that the results obtained by him thru this combination of methods were incomparably greater than he was ever able to realize with either alone. We have abundant warrant for expecting better results from the combined treatment than from either alone—an expectation justified alike by theory and practice.

The imperative condition to be attained in psychic treatment is to bring the patient into right relationship with the operator. The methods for accomplishing this are numerous and varied and must be determined to a considerable extent by individual preference and judgment. The administration of a drug or the application of any other material agent, apart from its inherent value, serves the very highly important purpose of what I may appropriately call "objectification." They tend to put the patient's mind and neural organism into a receptive condition and facilitate the necessary surrender to the action of *vis medicatrix* which it is the design of all forms of treatment to evoke. In other words, these material agencies, when judiciously employed, aid very powerfully in bringing our patients into the sub- or super-conscious state where psychic suggestion is most readily accepted and appropriated. The greatest barrier to success in psychic treatment is usually our inability to read-

ily bring our patient into this condition of passivity and surrender to the power that is evoked in his behalf.

The electro-therapist enjoys the exceptional advantage of accomplishing much if not all of this for his patient automatically. Patients usually come to us manifesting the keenest interest in what to them is a novel form of treatment. Electricity as a curative agent possesses a sort of fascination for most people. Faith in its remedial capabilities generally coincides pretty closely with the degree of interest that this agent arouses. Patients who seek electrical treatment come to us expecting to be benefited if not cured. Then, too, the armamentarium of the electro-therapist appeals to them; and his subsequent manipulations in the application of the electric current afford an almost ideal opportunity for initiating and completing the psychic impression. No other therapist possesses a tithe of his advantage. We do not have to explain, argue, or entreat; nor do we antagonize our patient's prepossessions or arouse his fears (not to mention those of his friends) as is too often the case in treatment through hypnosis. The patient ordinarily goes into our consulting rooms fully prepared to receive and appropriate all the help that we are disposed to offer,

regardless of its character or the method of its application.

As the caption of this paper indicates, it is my firm conviction that the relationship between the two forces of psychic suggestion and electro-therapeutics is a natural and ought to be a close and intimate one. Experience will not fail to demonstrate that the one, if given the required opportunity, will supplement the other. The electro-therapist who treats his patients psychically as well as electrically will not fail to greatly enlarge his list of curable diseases. By such procedure he will discover possibilities in electro-therapeutics far surpassing his present fondest and most ambitious hopes.

Professor William James, of Harvard, in his statement of the psychological proposition that "whatever determines attention, determines action," has given us the hint which if intelligently applied to each case individually will lead to the solution of the ever present but oftentimes perplexing problem of how best to make the attempt to arouse the desired psychic stimuli in our patients. The correct solution of this problem and the intelligent application of right psychic methods will, in my judgment, remove many of the limitations of electro-therapeutics by converting into present actualities many of the impossibilities of the past.



## Suggestions in the Treatment of Advanced Malignant Diseases of the Uterus.

BY ERNEST A. HALL, M. D., VICTORIA, B. C.

Fellow of the British Gynecological Association.

Those of you who have come in contact with cases of advanced malignant disease of the uterus will agree with me that of all conditions submitted to surgical treatment this has proved the most disappointing. It is withal a minor chord that we are compelled to strike in the discussion of this matter. After many attempts with the most elaborate methods the surgeon must often admit defeat, and is able to offer only methods of palliation.

It is a trite saying, that these cases come to us too late. It is these late cases that I wish to discuss. In order that I may not be misunderstood, I will classify the late classes as those (aside from papilloma of the cervix) which are characterized by ulceration with copious discharges, and which can be diagnosed by gross visceral, or digital examination, as distinct from those with less definite symptoms, in which curet and microscope are necessary for diagnosis. Cases with the condition practically confined to the endometrium, I will dismiss with the statement that they are amenable to complete hysterectomy (either vaginal or abdominal, or the two combined), the proportion of perfect cures varying with the skill of the operator.

Pozzi says "the more limited the disease, the more extensive the operation." In cases where the disease is confined to the cervix, a wide section with the galvano-cautery knife might be considered; but the engrafting of the cancer elements upon the raw surfaces can hardly be prevented, which will cause a return of the growth in the cicatrix.

Now, what can we do with the great

proportion of cases who have been led to consult us, from the foul discharge and progressive pain?

The answer will of course depend upon the condition. We must remember that malignant disease frequently increases rapidly in growth after being molested—probably on account of the opening up of fresh foci of absorption and irritation of the lymphatic elements, with consequent increased activity of the malignant cellular elements. For this reason, deep curetting is to be avoided; only the necrosed tissue must be removed. It is better, first, to apply caustics, which coagulate and destroy, thus sealing up the vessels. If there is periuterine infiltration, with any limit to the movement of the uterus or if the vagina and region of the bladder be affected, there is nothing to be done beyond the local cleansing, application of caustics, and general measures to relieve suffering.

Surgical measures, other than mild curetting, are absolutely contra-indicated, in such extensive involvement. The patient will live longer, and suffer less discomfort, than when radical operative measures are attempted.

Inoculation of the combined toxins of bacillus prodigiosus, and erysipelas, has not thus far been successful.

The x-ray has relieved pain, but we have secured nothing more, so far, in these cases, from its application.

It has remained to Massey to give us a treatment that apparently meets the indications in cases where the disease is still confined to the uterus and cervix, and also applicable, surgically, in all cases where radical measures are of as-

sistance. His treatment is based upon the fact that during the passage of a galvanic current through the body decomposition of compound chemical bodies is caused—the acids accumulating at the positive pole and the alkalis at the negative pole; also, there is the actual transmission of liquids and solids (in solution) in the direction of the current: "anodal affusion." This can be shown by an experiment: Place two porous cups, equally filled with water, in a pan of water of the same depth; then pass the galvanic current, by placing one pole in each cup; in a few minutes, the water in the positive cup will be lowered, while the water in the negative will be higher.

With an amalgamated zinc or copper positive electrode placed in contact with the diseased uterine tissues, and the negative attached to a large abdominal electrode the oxychloride of mercury and zinc (or copper) is formed, which is transmitted thru the tissues toward the opposite pole. Thus we obtain greater activity with the nascent chlorids, and a greater degree of penetration than by the ordinary method of topical application. Massey says "the radiating stream of mercuric oxychlorids will be diffused to a considerable distance in decreasing density, depending in extent on the amount and duration of the current, and will produce a zone of sterilization in the cancer cells which succumb, while the normal cells show a mere irritative action."

The current required for the application of this treatment can easily be obtained in cities where the Edison direct current is used, otherwise a galvanic battery of from 20 to 30 cells will be necessary. The current which I use is a 500 volt direct, supplied by the B. C. Electric Ry. Co. By passing it thru a bank of lamps, it is reduced to 100 volts;

then thru a graduated rheostat, with a milliamperemeter in the circuit. I use electrodes (preferably zinc), with a surface of 9-12C. and a felt abdominal electrode of 800C. The positive electrode must be sterilized by boiling; the zinc portion dipped in mineral acid, then into metallic mercury, then wrapt with cotton saturated with bichlorid of mercury, and inserted against or into the uterus. With both electrodes in position, the current is gradually turned on to the extent of the patient's ability to bear, generally from 50 to 150 ma., and continued for twenty or thirty minutes. This may be done daily if the patient can endure it. A removal of the fetor, and a cessation of the discharge are at once noticed, with a blanching of the surfaces and an apparent check in the growth. But of course a cure cannot be thus secured in these late cases—merely prolongation of life and diminution of discomfort.

To what extent must we rely upon the report of the microscopist? To follow the Johns Hopkins' clinic, one would be led to the opinion that the pathological report is all but infallible, but Hunter Robb reports the examination of the scrapings from 100 cases, and he found that in 95 he was unable to make a positive diagnosis by the microscope. And Coe says: "In younger women in the prime of life, with irregular hemorrhages, where we suspect malignant disease—unless the history is very strong—we should consider the case as doubtful, until proven by the microscope. But in women of advanced years with a fairly well marked history, especially of obstinate, atypical bleeding, when we remove material that is of a suspicious character, we are justified in making a diagnosis of malignancy, even though the microscope throws no positive light upon it."—*American Journal of Surgery and Gynecology.*

Spiral segment (utero-ovarian artery), 1, 2, 3, 4, 5, 6, 7, 8, 9, 10, 11, 12, 13, 14, 15.  
 Straight segment abdominal aorta, 16. Common iliac, 17, and internal iliac, 18.

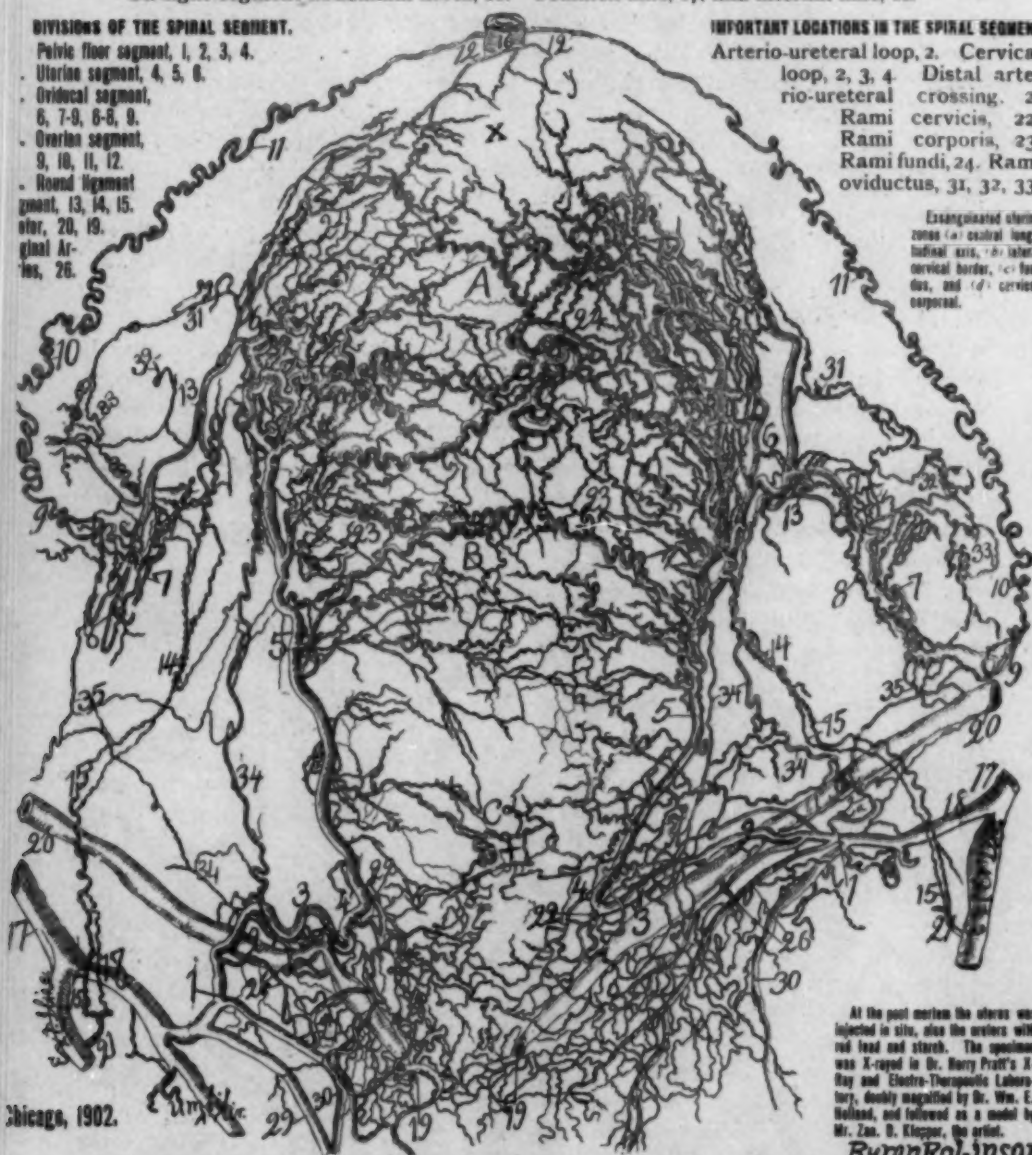
#### DIVISIONS OF THE SPIRAL SEGMENT.

- Pelvic floor segment, 1, 2, 3, 4.
- Uterine segment, 4, 5, 6.
- Oviducal segment, 6, 7-9, 8-8, 9.
- Ovarian segment, 9, 10, 11, 12.
- Round ligament segment, 13, 14, 15.
- Ovarian segment, 20, 19.
- Iliac Arteries, 26.

#### IMPORTANT LOCATIONS IN THE SPIRAL SEGMENT

- Arterio-ureteral loop, 2.
- Cervical loop, 2, 3, 4.
- Distal arterio-ureteral crossing, 2.
- Rami cervicis, 22.
- Rami corporis, 23.
- Rami fundi, 24.
- Rami oviductus, 31, 32, 33.

Exsanguinated uterine zones (a) central longitudinal axis, (b) lateral cervical border, (c) fundus, and (d) cervix-corporal.



Chicago, 1902.

At the post mortem the uterus was injected in situ, also the ureters with red lead and starch. The specimen was X-rayed in Dr. Harry Pratt's X-ray and Electro-Therapeutic Laboratory, doubly magnified by Dr. Wm. E. Holland, and followed as a model by Mr. Zan. B. Kieppner, the artist.

Byron Robinson.

### Arterial Circulation of the Puerperal Uterus.

Four Hours Post Partum—Life Size.

Illustrating the Utero-Ovarian Vascular Circle (the Circle of Byron Robinson).

THE ABOVE IS AN X-RAY PHOTOGRAPH OF DR. WILLIAM E. HOLLAND'S CASE.

## Report of a Case of Ventral Fixation, Pregnancy, Invagination of the Uterus, Death and Autopsy.

BY DRS. WM. E. HOLLAND AND BYRON ROBINSON.

In the obstetrical case and post mortem which I report this evening, I shall simply relate the patient's general history previous to and during gestation, clinical observations during delivery, and the revelations of the post mortem.

The patient, a well developed woman of twenty-six years, passed her early life without accident and suffered with but two of the diseases incidental to childhood, measles and whooping cough, from which she experienced little inconvenience and recovered completely. She began her menstrual function at the age of seventeen. The periods were extremely painful and the flow scanty. Her suffering being so intense as to necessitate rest in bed four to six days, and the use of powerful anodynes, etc. In consequence of increased suffering and disability her attending physician suggested operative interference and treatment at the hospital. To this the patient submitted, with the result that no improvement was effected, but on the contrary, pain was experienced, not only at the periods, but also in the interim. She was married in September, 1896, and had a miscarriage two months later, recovering from this accident within a week, with no evidence of infection, and apparent complete recovery.

Her sufferings continued increasingly until March, 1898, when a laparotomy to remove the ovaries, which were considered to be the cause of the trouble, was suggested by the physician having her case in charge. Upon opening the abdomen, the condition of the ovaries, in the surgeon's judgment, did not warrant their removal, but, on account of the extreme posterior displacement of the uterus, he determined to perform ventral fixation, which was done, according to Martin's method, in a

manner and with results entirely satisfactory, surgically, but with no relief to the patient. August, 1901, she became pregnant. During the entire period of gestation, the patient suffered intensely and increasingly, with dragging sensations and pains throughout the lower anterior portion of the abdomen, until, toward the close of this period, they were so severe as to frequently cause faintness and nausea. Otherwise the conditions were, in general, satisfactory.

I first examined the patient about six weeks before delivery. The position of the uterus was such, that the os was high and directed backward so decidedly that I experienced considerable difficulty in discovering it. Labor began at 6 a. m., June 14, 1902, with a sudden escape of about half a pint of liquor amnii, while the patient was still in bed. Examination about two hours later revealed the os still markedly posterior and dilated to the extent of admitting two fingers. The presentation was L. O. A. Pains were very severe and effective, the patient complaining of greater suffering and exhaustion as labor progressed, until when the child was expelled alive and well at 12:45 p. m., she was practically in a state of complete collapse, and writhing in pain, referred to the back and lower abdomen. After tying the cord, etc., vaginal examination revealed the placenta partially protruding from the uterus, with no external evidence of hemorrhage or other local abnormal conditions. Continuous, extremely violent expulsive pains soon brought it to the vulva, its delivery being normal and unassisted, and complete with the exception of a piece of the membranes, about three inches square. The entire process of the third stage of labor was concluded within half an hour.

Pale, collapsed and in agony, with a pulse of a hundred and forty, respirations fifty, sighing and gasping in character, and covered with profuse cold perspiration, was the picture presented by the patient. With no local evidence of hemorrhage, or other apparent cause for this condition I introduced my hand into the vagina. This examination revealed an open condition of the os through which two introduced fingers could feel a peculiar, thin, membrane-like flap, apparently suspended from the fundus of the uterus, which organ was quite regularly contracted. Dr. Orville W. MacKellar, whom I called in consultation, carefully examined the patient, noted her desperate condition, and suggested a continuance of the stimulating and sustaining efforts instituted, but in spite of all local and constitutional treatment, she succumbed at about five p. m., three and a half hours after delivery, with all the typical symptoms of shock.

Being unable to determine the cause of death, I suggested a post mortem, which was allowed, and performed in the presence of Dr. MacKellar, with the assistance of Dr. Byron Robinson. Accurate observations were made concerning the topography of the pelvic organs, the uterine circulation was injected in situ, with red lead, the entire organ removed, carefully examined, and x-rayed, with results which will now be described by Dr. Robinson.

#### AUTOPSY.

Drs. Wm. E. Holland, Orville William MacKellar and myself performed a post-mortem on this woman who died three and one-half hours post partem.

She had been operated upon for ventral hysteropexy four years previously. The child was alive and well. Arriving shortly after death I made a bimanual vaginal examination. A large soft mass was palpable per vaginam but the parts were so soft that nothing could be definitely determined. Upon opening the abdomen in the median line from xiphoid appendix

to symphysis pubis dense omental adhesions were encountered. Abdominal inspection revealed a completely invaginated uterus. A peritoneal band about the width of two fingers and some six inches in length and mainly composed of omental tissue, passed distalward, penetrating the lumen of the invaginated uterus. The invagination was so complete that the ovaries rested on the proximal rim of the uterus. The oviducal pavilion also projected proximal to the lumen of the invagination. The index finger alone could penetrate the neck of the telescoped uterus. The organ was easily disinvaginated by drawing on its omental band which was fixed to the proximal fundus, with one hand, while the other hand in the vagina forced the uterine fundus proximalward. On examination after disinvagination it was found that a fundal space about three inches square had become extremely atrophied from the dragging of the omental band which was fixed to the fundus.

The uterine wall adjacent to the atrophic fundus was six to eight times as thick. In fact the fundal wall was so atrophic and thin that the finger could press it distalward and proximalward like a movable diaphragm. The remaining pelvic organs appeared normal. A drawing was made of the conditions found and the uterus injected in situ with red lead and starch. The specimen was x-rayed, then prepared and found accurately as a drawing model.

Subjects with ventral hysteropexy may suffer from (a) pain in the hypogastrium; (b) abortion or premature labor; (c) dragging from the fixation and nausea; (d) traumatic tension will prevent segments of the myometrium from developing—remaining atrophic; (e) the cervix may pass proximalward and the fundus remain distalward; (f) the cicatrix may form a depression in the abdominal wall.

Difficulties During Labor.—1. Parturition may be impossible on account of (a) the changed direction of uterine force;

(b) or the atrophy of myometrial segments; or (c) a mass of tissue may obstruct the pelvic canal.

2. Parturition may be delayed.

3. The cervix may be unable to dilate on account of abnormal position.

4. Malposition of the child is more liable to occur.

#### CONCLUSIONS WITH FINDINGS.

1. Death was caused by invagination of the post partum uterus due to a ventral hysteropexy performed four years previously.

2. The direct cause of the invagination was the atrophy of the fundus due to the dragging of the peritoneal band on the fundus.

3. The direct cause of death was heart-shock. The trauma was carried to the heart over the hypogastric and ovarian plexuses by way of the abdominal brain and splanchnics to the cervical ganglia. Here the nervous shock was reorganized and carried directly to the heart over the three cervical cardiac nerves. The force

passed also over the II, III and IV sacral nerves by way of the spinal cord to the brain, where it was reorganized and emitted directly to the heart over the pneumogastrics.

4. This subject experienced suffering during gestation from dragging of the peritoneal band fixed to the uterine fundus. I have known of a number of cases of severe pain during gestation which had followed a ventral hysteropexy. Reports are constantly increasing in which Cesarean or other section is required at parturition subsequent to the performance of ventral hysteropexy.

5. It is rational to conclude, therefore, that ventral hysteropexy should not be performed in a reproductive subject.

6. Moreover the large majority of women with retrodeviations are not suffering from the uterine displacement but from the accompanying myometritis, which is the chief pathological factor and which is not cured by producing another fixation and dislocation of the uterus.

### Chicago Electro-Medical Society.

The twenty-first meeting of the Chicago Electro-Medical Society was held on Monday evening, April 27th, 1903, on the 17th floor, drill hall parlor, Masonic Temple. The following names were proposed for membership and duly elected: Dr. Chas. P. Donaldson, Dr. E. H. Pratt, Dr.

O. W. McKaller, Dr. J. A. Horne, Dr. H. R. Wallace, Dr. G. Tedtman and L. M. Rader.

The next meeting of the society will be on May 25th at 1207 Masonic Temple.

Papers were presented as follows:

### Some of the Little Known uses of Electrolysis.

BY H. P. FITZPATRICK, PH. R., M. D.

Mr. President and Gentlemen of the Chicago Electro-Medical Society: In this brief article it is not my intention to take up the treatment of the more familiar facial defects, such as superfluous hair, moles, birthmarks, etc. The general technique and *modus operandi* for the application of electrolysis in such cases are pretty generally understood by all practitioners.

But I do wish here to emphasize a fact which those who blame electrolysis for failure to meet perfect success in its application do not seem to realize; and that is that no one can hope to compete with the busy specialist, except by making electrolysis a specialty. This operation is not for the general practitioner who treats one or two cases a year. It must go to one who works day after day

and by constant application becomes familiar with the texture of each individual skin.

In all my experience I do not think two persons whose skin would present exact counterparts have been under treatment. You cannot therefore put down a set rule for so many milliamperes for every case. I find as a rule that the brunette requires more electrolysis, to complete as much work in the same length of time, than is required for the blonde.

The insertion of the needle is a simple matter it would seem, but in a case of superfluous hair, for instance, how many of you who have attempted it can say you felt assured the needle followed the hair shaft accurately down into the sack. You know unless you do insert accurately you are expending electrical energy and setting up unnecessary inflammation, with even the possibility of a resultant eschar. Whereas with accurate insertion you will have minimum inflammation, and the possibility of eschar need trouble you no further. How then can you arrive at the point of nearest electrolytic success? Simply by devoting your whole time to the work. Practice in this as in no other specialty is the greatest element of success. Given the eye for accuracy, given the hand that does not tremble from lack of confidence, and add your experience, and we can call this a perfect electrolysis qualification. But I am digressing from the heading of this article.

Six years ago I met with a most obstinate case of acne pustulosa, in which diet, astringents, puncture, soothing and stimulating ointments were only palliative and the results but temporary. At last it occurred to me that electrolysis might be of some help and therefore with the idea of aseptizing the eruption I inserted the needle, previously attached to the negative pole, into each pustule. I used at first a minimum cur-

rent of two milliamperes and decomposed the sacculi pretty thoroly. Then I evacuated the contents of the pustule and cut out all other treatment in order to ascribe the result whatever it might be to its proper source. The patient was dismissed after the face was gone over thoroly and all visible pustules treated, with instructions to call in a week. Much to my surprise and greatly to the gratification of the patient the parts treated had healed mildly and with the exception of a pinkish dermatitis of the immediate tissue (which vanished completely later) new healthy granulated tissue had replaced the seat of the acniform lesions. Since then acne pustulosa has had no terrors for me. Now after years of experience I find but three adjuncts which are at all essential in the cure of what was formerly a hard disease. I use in conjunction with electrolysis weekly faradization of the face and neck to stimulate capillary circulation and accelerate perifollicular tissue changes. I use also the following:

R

Hydrarg. bichloridi, grains five,  
Spts. camphor,  
Glycerini,

Tinct. saponis viridis, aa drachm one.  
Spts. vini rectificat., ounce one.

Aque rose, q. s., ad. ounces four.

applied every night, for its aseptic, astringent and stimulating properties; and, finally, Cascara evacuant (P. D. & Co.'s)  $\frac{1}{4}$  drachm one-half hour before breakfast, to overcome constipation, if present. I give one treatment a week, using electrolysis for removal of all visible pustules and comedones, and then faradize the parts previously treated. With reference to time, the worst cases have never taken more than three months, while less aggravated cases yield in two.

#### *Powder Stains*

are so disfiguring that any method that

will give promise of success in their elimination should be thoroly tested. Electrolysis alone is, I am sure, the best and most effectual method generally known, but I have never been entirely satisfied with the results. In order to entirely obliterate the stain too much disintegration of tissue occurs. A white scar replaces the blue stain, which, while not quite so unsightly, is not exactly satisfying to a conscientious operator. In recent cases, I have obtained good results by using peroxid of hydrogen in conjunction with electrolysis. I proceed as follows: Using from two to three milliamperes of current with negative pole to needle, touch with peroxid the spot to be treated, then tattoo the skin over the stain, by repeatedly inserting needle until the area of discoloration has been completely covered. Keep the surface of the stain saturated with peroxid and work with the idea of thoroly penetrating the decomposed tissue with it.

When the seat of the former stain has become blanched by electrolysis and bleached by peroxid until no stains are visible, suspend treatment on that spot and treat the remainder in the same way until the face has been covered. So far as I know, these are original methods. If they are generally used no mention has been made of them. When the peroxid is used you must go at it with the intention of penetrating the stain with the peroxid and at the same time tattooing sufficiently to create a crust formation, averting, however, the possibility of a cicatrix.

With above treatment the stains are so nearly bleached out or carried off by the crust formation as to leave scarcely a perceptible trace. I know of no other blemish that requires so much care and patience, but surely success in even one case justifies you for all the time and care so necessary to insure complete erad-

ication. As you will not find soft follicular openings for easy insertion of needle in these cases, it is well to obviate pain as much as possible and therefore see to it before you begin treatment that the needle is exceedingly fine and very sharp pointed. You should not insert it below the depth of the stain. As the needle must be inserted repeatedly in a very small area, you should allow but a few seconds of electrolytic action to each insertion. To those physicians who do not care to take up the treatment of these cases by electrolysis and would like some other easily applied method I would advise, first, (if stains are recent) the hypodermic injection of peroxid. Insert the hypo-needle into the stained area and saturate it with injected peroxid. Secondly, Croton oil. By injecting a drop of Croton oil below the seat of the stain the oil will set up a sufficient inflammation to incite an artificial furuncle. All material foreign to the skin will be carried off when the pus contents are evacuated. I would not advise more than two or three injections in widely separated portions of the face at a sitting. A great many cases have been successfully treated in this way, but it is assuredly a most heroic method when compared to electrolysis and peroxid.

I intended to take up other treatments and especially tattoo (India ink marks) but this article has already taxed your patience, and I will take up other defects and their treatment at some future time.

I do not doubt but that the x-ray treatment of acne will soon relegate my present method of treatment by electrolysis as much to the rear as electrolysis relegated former methods. But, just at present, with the results I get, I find parting from electrolysis in the treatment of acne to be a great deal on the order of parting from a tried friend. Therefore I am not going to say good-bye just yet.

## Combined Chemical and X-Ray Treatment of Cancer.

BY O. W. M'MICHAEL, B. A., M. D.

For the development of cancer two elements are essential, first, the presence of the parasite, and second, a chemical condition of the tissue favorable to the growth of the parasite. Upon the latter depends the degree of malignancy and the rapidity of the growth.

Two schools of investigators are at present trying to explain cancer, the one maintaining that the cause of cancer is a parasite, the other, that it is the result of a local chemical change in the tissue producing local katabolic stasis. It is not my purpose to discuss the two lines of argument, but to express the belief that both schools are presenting to us a half truth, and that both are right as far as they go. This belief led me to adopt the method of treatment employed in the case which I wish to present for your consideration this evening.

Dr. M., a surgeon from a neighbouring town consulted me in January last with regard to an epithelioma on his lip. It involved the middle third of the lower lip and was growing rapidly. He told me that for some months there had been a fissure in the median line which refused to heal, and that a few weeks previous to the time I saw him, he had accidentally put the lighted end of a cigar into his mouth. From that time the development was rapid. In consultation with Dr. H. P. Pratt, we decided to employ

the combined chemical and x-ray treatment, a method which seems to promise better results than either method alone.

Various antiseptics were daily applied to the growth, and then the lip exposed to the x-ray for ten minutes, the dressing being allowed to remain for twenty-four hours. This treatment was continued daily for three weeks and then at intervals of several days for three weeks more.

Result, complete disappearance of the growth, and perfect healing, with scarcely perceptible scar.

By this combined method the parasite is destroyed by chemical action, while katabolism is stimulated by the x-ray.

The chemical treatment differs from the ordinary escharotic treatment in the employment of chemicals which are slowly absorbed, limiting the dosage to the quantity of diseased tissue, following this procedure by other applications which produce rapid necrosis. In the sloughing which follows lies the great advantage of this method of treatment.

Broken down cells and cells infected by the parasite escape by the shortest path and the lymphatics are relieved of the duty of disposing of infected material.

The x-ray assists katabolism, but unless there be an avenue of escape for the dead cells, we may expect disturbances of a toxic character.

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## Report of a Case of Vesical Calculi.

BY ORVILLE W. MAC KELLAR, M. D.

The patient was six years old, one brother, family history negative. Never was sick until two years ago. While playing he fell and was taken home, complaining of pain in the region of the

bladder. A physician was summoned and means instituted to relieve pain. The patient from this time on has had series of excruciating, sharp shooting pains in the region of the kidney, ureter

and bladder, extending down along the course of the spermatic cord, sufficient to double him up and make him roar in agony, accompanied by nausea, rigors, restlessness and frequent attempts to pass urine. At times there was incontinency of urine. Numerous examinations have been made under anesthesia. Instrumentation of bladder with sounds has been resorted to. All this, and more, too, with negative results. A thoro course of medica-

made two days later by Dr. Pratt, revealing two large stones situated in the bladder. The patient was taken to the hospital and prepared for operation. On March 20, I removed by a superpubic incision two stones, each about the size of a walnut. The bladder was not infected, but was large and extremely hypertrophied. The wound was closed by two rows of Lembert sutures, also superficial and deep sutures of the skin, no provi-



Fig. 1. VESICAL CALCULI IN SITU.  
Taken in Dr. Pratt's X-Ray Laboratory.

tion has been tried to relieve the steady progressive pain, which necessitates the boy's parents watching him day and night. I first examined the boy March 15th; and made a probable diagnosis of urinary calculi, insisting, however, that the boy be submitted to an examination by the most reliable means known to the surgeon, namely, the x-ray. The examination was

sion being made for draining. A catheter was placed in the bladder and permitted to remain four days, after which the boy voided urine naturally. The patient made a complete recovery and is now attending school. The case is of more than ordinary interest, being a six year old patient with multiple stones. It also teaches the importance of resorting

to an early x-ray examination. In competent hands the value is positive. We know thru the investigations of Dr. Byron Robinson where to look for calculi, namely, in the calyces of the kidney and the ureteral spindles. He has been working with the x-ray and corrosion anatomy experimentally on animals, demonstrating that there is a zone in the kidney where it is safe to cut without producing hemorrhage. Upon looking up the literature he found that over 30 years ago Hyrtle demonstrated this fact. Therefore, Dr. Robinson very honorably named this region Hyrtle's exsanguin-

two or more may be found. Sir A. Cooper extracted 242 at one time. An authentic case exists where a surgeon removed 1,000 calculi from Judge Marshall. As the chief constituent of healthy urine is urea, so does uric acid constitute the nucleus in the great majority of urinary calculi. Dr. Ultzmann, in examining 545 single vesical calculi, found that the nucleus was formed of uric acid 91 per cent. The occurrence of calculi in early life has been attributed to those infarctions of uric acid which are often found in the kidneys even of new-born children. The urine of child-



Fig. 2. VESICAL CALCULI.  
Actual size is one-half larger than the cut.

ated renal zone. It lies one-half inch dorsal to the lateral longitudinal renal border. Calculi ordinarily vary in weight from a few grains to several ounces, the great majority being under one ounce. The smallest that ever came under Mr. Coulson's observation and was removed by him, weighed only five grains. The largest vesical calculus on record is said to have been in possession of the French lithotomist, Morand. It weighed six pounds three ounces. An enormous stone weighing 51 ounces was long preserved in the hospital of La Chartre, Paris. It was extracted after death. In a great majority of cases the calculus is solitary, but

ren contains a large quantity of uric acid during the first week of life, crystals of which often form spontaneously when the fluid is at rest.

The formation of a calculus may be either primary or secondary.

Primary stone formation takes place always in the kidneys, whereas the secondary stone formation is confined almost exclusively to the bladder. The primary stone formation originates with a few exceptions, from uric acid. The secondary stone formation from the earthy phosphates. Oxalate of lime is adapted for the formation of layers rather than nuclei.

### Prof. J. J. Thomson on Radium.

Prof. J. J. Thomson, the discoverer of the corpuscle or electron, has entered the field with an explanation of the mystery of radium. In an article of the highest interest, in *Nature*, April 30th, he discusses and demolishes some of the explanations that have already been offered, and shows that the phenomena of radio-activity, as far as they are known, all point to the conclusion that the radiant energy is derived from changes taking place inside the atom itself.

Sir William Crookes (*Electrical Review*, p. 682) believes that the energy of radium is derived from the surrounding air. The radium is supposed to have the property of absorbing the energy of the high-speed molecules of the air, and thus raising its temperature above that of the surrounding air. Prof. J. J. Thomson fails to see that even the possession of this property would explain the behavior of radium; "for imagine," he says, "a portion of radium placed in a cavity in a block of ice; the ice around the radium gets melted; where does the energy for this come from? By the hypothesis, there is no change in the energy of the air-radium system in the cavity, for the energy gained by the radium is lost by the air, while heat cannot flow into the cavity from the outside, for the melted ice around the cavity is hotter than the ice surrounding it."

Another theory, favored by M. Curie, the discoverer of the energy of radium, is that radium has the property of absorbing some kind of Becquerel radiation constantly flowing in surrounding space. That some kind of highly penetrative radiation is being continually emitted from the earth's surface has been recently demonstrated by McClellan and Burton (*Elec. Rev.*, p. 746). Experience has shown that Becquerel radiation is most

readily absorbed by substances of high atomic weight, and the high atomic weight (225) of radium is in favor of the view that radium would be a powerful absorbent of the radiation. But many other substances such as gold, platinum, and lead have atomic weights nearly as high as radium, they are strong absorbers of Becquerel radiation, and yet none of them are strongly radio-active.

It appears, therefore, that all the theories hitherto put forward to show that radium derives its perennial supply of energy from external sources, are unsatisfactory. We are now driven to seek for the source of energy in changes taking place in the atom itself. Assuming that the atom of radium is made up of pairs of positive and negative corpuscles held together by electric attraction, J. J. Thomson has calculated that the expenditure of 1 per cent of this energy would be sufficient to supply the flow of energy measured by M. Curie.

It is necessary, however, to find a determining cause for the liberation of this sub-atomic energy, and herein consists the most ingenious part of J. J. Thomson's theory. It is the high-speed atoms which become unstable and radiate part of their internal energy into space. It is believed by physicists that the velocities of the molecules of solids and liquids, like those of gases, are continually changing, owing to collisions. The mean velocity remains the same at constant temperatures, but the velocities of single molecules are continually rising above and falling below the mean. Thomson assumes that the internal constitution of the atom may become unstable when it attains a velocity, say, 100 times the mean velocity. Under these circumstances the atom becomes partially disintegrated, and throws off the positive and negative electrons which are known

to be emitted by radium. The percentage of the total number of atoms which attain this high velocity, and become unstable, is always very small, but the number is sufficient to maintain the energy emitted by radium for 30,000 years if we assume that each atom loses only 1 per cent of its intrinsic energy.

The known phenomena of radio-activity fit in very well with this theory. Becquerel has shown that the radio-active element can be separated from uranium by precipitation, and Rutherford has shown that the active element of thorium, which he calls thorium X, can be precipitated by ammonia. Now uranium X, and thorium X, gradually lose their radio-activity, and the uranium and thorium which have lost their radio-activity by precipitation, gradually recover it again. What happens, according to Thomson's theory, is obvious. The precipitate carries down all the atoms whose speed is so high that they are in the unstable condition. In

course of time these atoms radiate off the energy derived from their internal changes and lose their radio-activity. The original substances, in the meantime, are acquiring, by the inter-action of their atoms, a fresh supply of high-speed atoms in an unstable condition, and thus recover their original radio-activity. The steady state of radio-activity is reached when the emission of energy is equal to that capable of being supplied by the number of atoms which attain the critical velocity.

The demons of Clerk-Maxwell were imagined to show how the temperature of a gas might be raised by merely opening the doors for the high-speed molecules. If the theory of Prof. J. J. Thomson is correct, we have the high velocities themselves acting automatically to pull the trigger and liberate amounts of energy sufficient to permanently raise the temperature of surrounding bodies.—*London Electrical Review*, May 8, 1903.

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### Radio-Praxis.

Piffard (*Medical Record*, March 7th, 1903) began to treat lupus with sun's rays 25 years ago. He concentrated the rays on the ulcer and burned it out. The ultra-violet rays do not penetrate glass and were lost in these experiments. Draper found that even the violet rays possess caloric properties. Finsen was able by using ammonio-sulphate of copper solution as a ray filter to absorb most of the heat. This treatment was effective in malignant disease by long sittings daily at great cost. He then substituted the electric arc for sunlight, and quartz for glass in employing the ultra-violet light. Improvements have been made as to time and expense by the Lortet-Genoud and Bang lamps. He recommends a low tension arc lamp, French model, as the most

practical. It has two arcs connected in series and so arranged that the light from both is projected to the same point. Being connected in series we obtain nearly double the effect, with a given electric current. The electric arc has a much larger proportion of ultra-violet radiations than sunlight. The condenser spark utilized in the Görl lamp gives still more of these rays. The Roentgen ray was found to be of more or less value in malignancy. Various experiments proved that the ultra-violet rays and the x-rays are clinically different. The Finsen light is suitable for superficial, and the x-ray for deeper lesions. In the Görl lamp an extremely high tension high frequency current obtained from an x-ray coil in connection with a condenser and metallic terminals is

employed. The parts treated must be anemic, and a compressor of quartz, rock-salt, or ice is used. With the Finsen light inflammatory reaction leaves no ill effect, whereas the x-ray may cause serious ulcerations. The Görl lamp, manufactured by the Waite & Bartlett Mfg. Co., he considers as the best. It has four spark gaps. Two or more of these lamps may be connected in series and their efficiency increased with the same amount of current. In using the apparatus firm pressure is made on the part by the patient, and the time need not exceed ten or fifteen minutes, repeated daily. If inflammation is caused, discontinue for a few days. By injecting suprarenal extract the part promptly blanches and permits the rays to act. It is best used by kataphoresis by covering the kataphoric electrode with lintin saturated with adrenalin chlorid, connected with positive pole of the battery, using a current of 3 to 4 ma. for five minutes. When using the high-tension arc the quartz compressor should be applied to protect the part from bulging up too near the spark gap. He uses the static machine as the source of high-tension electricity, and as a condenser Leyden jars having 100 square inches of internal and the same of external foil surface in connection with each pole of the machine. The lamp is then connected by its conducting cords to the other surface of the jar. The poles of the machine, in action, are separated one inch and the terminals of the lamp one-eighth inch. The high-tension arc may be actuated by coil or static machine and two or a dozen lamps may be connected in series and an equal number of patients treated simultaneous-

ly. By using a step-up transformer in connection with the static machine, the static induced current passed thru the coil of coarse wire induces a current of high potential in the secondary coil. An electrode connected with this latter coil and brought within one or two centimeters of the skin will cause a spark to pass between the electrode and the skin—the hyperstatic spark. The application of this spark caused an inflammation, and has proved curative of infiltrated eczema and other skin lesions. This spark is also proved to be like ultra-violet light in causing a piece of Willemite to fluoresce in a darkened room.

The Finsen light is invisible and constitutes the ultra-violet rays of the spectrum. The luminous rays, red to yellow, have been found to exert a calming effect in conditions of mental excitements; in exanthematous disease, especially small-pox, reducing the fever and lessening the suppuration. These rays are produced by passing sunlight or strong artificial light thru ruby glass. The blue to violet rays act as a general tonic and act specifically in tuberculosis. Case reported by Ciascia: "Child, nine years old, sick two months with fever, anorexia, vomiting, wandering pains in abdomen, intestinal disturbances, and for last forty days notable distention of abdomen. Lymphatics engorged in surgical axillary and inguinal regions with nodosities among the abdominal lymphatics. Diagnosis, tubercular peritonitis. Treatment, daily exposures to condensed blue-violet rays from the sun. After three months the child was entirely free from the former evidences of ill health."



## American Medical Association.

At the New Orleans meeting of the American Medical Association Dr. DeForest Willard, of Philadelphia, opened the proceedings Thursday morning, May 7, with a paper on "Sunshine and Fresh Air vs. Roentgen and Finsen Rays in the treatment of Tuberculosis of Bones and Joints." His conclusions were that sunlight and fresh air, with fixation of the part, was the best treatment for tuberculosis of hard tissues; that treatment by tent life was successful both in winter and in summer; that there should be established sanatoria for the treatment of tuberculosis of hard tissues; that concentration of the sun's rays was beneficial in the treatment; that x-rays inhibit the growth of the germ in the laboratory, but that this is not definitely proved about the germ in the tissues; that both actinic and x-rays were to be used as adjuncts to other methods, not as superseding them. Dr. J. C. Stewart, of Minneapolis, followed with a paper entitled "Epithelioma Under the X-Rays. A Preliminary Report of the Histological Changes." This was an exhaustive report of the changes following upon the treatment of epithelioma with the x-rays. The changes shown were fatty degeneration, vascularization in the center of the pearls, the formation of elastic tissue in the vicinity of the vessels, hyaline degeneration in the pearls, and

necrotic changes in the cells. Dr. Christian, of Boston, was not prepared to say what is the exact cause of the improvement, but does not think the fatty degeneration important. Dr. Nicholls, of Boston, said the x-rays were evidently beneficial, but all cures are to be regarded with suspicion. He thinks the action of the rays is a penetrating mild irritant, sufficient to cause necrosis of low grade cancer tissue. He calls attention to the fact that the x-rays can also produce cancer, giving a case illustrating this. He never saw a true Plimmer body in epithelioma. He believes in operative treatment first, followed by x-ray treatment. Dr. Ridlon, of Chicago, does not think sunlight alone curative in joint tuberculosis. The effect of outdoor treatment is rather a general improvement of the patient's health. He is not encouraged by his experience in the use of x-rays for bone tuberculosis. Dr. Lund, of Boston, agrees with Nicholls as to the caustic action of the x-rays in cancer. He thinks them specially indicated in epithelioma of the face. Dr. Willard, in reply, dwelt on the point that the light treatment was merely to be used as an adjunct to the other methods, in cancer and tuberculosis. Dr. Stewart dwelt upon vascularization as one positive fact in the curative effects of the rays.—*Phila. Med. Journ.*, May 16, 1903.

## Opinions of Surgeons on the Therapeutic Value of the X-Ray.

Expressed at the Twenty fourth Annual Meeting of the American Surgical Association held at Washington, D. C., May 12-14, 1903.

**Therapeutic Value of the X-Ray in Sarcoma.**—Dr. William B. Coley, of New York, presented a series of thirty-six cases, two-thirds of the number consisting of the round-cell variety. Of this

total number it could be claimed in but four that the growth had disappeared, and unfortunately in these there was recurrence. In all, however, there is no doubt that a certain relief of symptoms

can be obtained, although by the use of the x-ray alone sarcomata are not profoundly influenced.

**Use of the Combined Mixed Toxins and X-Rays.**—He said that the best results are to be obtained by this combination, there being no doubt that occasional cases which our knowledge does not yet permit us to choose from the unfavorable class, are profoundly influenced, and if not absolutely cured, much retarded in their development by the exhibition of this treatment.

**Dangers of the Treatment**—So far as this is concerned, it sums itself up into a judicious use of the agents, so that too much of the neoplasm may not be liquefied at once. Unless this precaution is taken, it is quite possible to make the patient extremely sick from septic absorption, and it is not outside the realm of the possible that metastatic growths may occasionally be caused by the absorption into the circulation of masses of still living malignant cells. Under no conditions does he consider it advisable to use the combination except in inoperable cases, or possibly very rarely in place of certain amputations. That the x-ray surely inhibits sarcomatous growth, particularly when used with the toxin, is not to be doubted. The cases upon which it acts favorably, so far as ultimate outlook goes, are, however, rare. But in these, it should be expressly noted that the treatment, particularly the rays, should certainly be continued for months and probably for years.

**The Therapeutic Value of the X-Ray.**—Dr. Arthur Dean Bevan, of Chicago, said that he had nothing strikingly new to present. Superficial epitheliomata melt away and disappear after twenty exposures from a soft tube at 100 volts and two amperes. In the lip, however, the outlook is not so favorable, since the mu-

cous membrane of this part is peculiarly liable to the so-called burn. In the breast, which may be taken of a typical example of a moderately deep neoplasm, the rays will often produce an apparent cure, but the patient usually dies of metastasis. The effect of the rays is in general determined first by the situation of the lesion, the vitality of the cells having a very direct bearing. Second, the rapidity of their growth. Third, the size of the neoplasm determines the effect of the ray, inasmuch as their value varies inversely as the size.

**Indications for Use of Rays.**—If we assume, as we probably may, that the ray rarely if ever stimulates the growth of malignant neoplasms, its chief use seems at present to lie in superficial and slow-growing areas, particularly about the face. All others should be extirpated and followed as a prophylactic measure by at least twenty exposures from a soft tube. Naturally the most important problem is whether there be a possibility of extending the power of the x-ray which works so admirably on the superficial growth, to great depths. This might be accomplished along two possible lines, viz., the physicist might be able to augment their power of destroying low tension cells without increasing their danger to the normal tissue, or it might be possible to reduce the vitality of the cells of the deep neoplasms and get destructive effects with the ray as we at present know it. He has conducted a number of experiments along these lines, and with his associates has given to their experiments the name—"Radiochemic therapy." So far their chief work has been in the direction of attempting to liberate nascent iodine in the neoplasm by first giving the patient immense doses of potassium iodid, and then turning the rays upon the part.

**The Value of the X-Ray in Superficial Epitheliomata and Tuberculosis.**—Dr. W. L. Rodman, of Philadelphia and Dr. G. E. Pfahler, of the same city, presented this paper. Dr. Rodman said that most of the work had been done by his colleague, who in a series of 234 cases of epitheliomata had found that 63 per cent were reported cured and 36 per cent improved. The average number of treatments for these cases being twenty-five, and the time consumed about eight weeks. Rodent ulcer presented a somewhat lower percentage of cure, the condition demanding a longer period of treatment. Of seventy-five cases of lupus vulgaris sixty-five were reported cured in eight weeks after forty treatments. Lupus erythematosus was shown to be just as obstinate as the aforementioned variety. The final results in each, however, compared most favorably with all other methods of treatment. Tuberculous glands in ten cases had all shown favorable results, while in Hodgkin's disease, the results, even in glands very deeply situated, had been profound.

**Action of the Rays.**—This is not yet understood, but a certain degree of necrosis of the cells is early established, while at the same time a quantity of elastic tissue begins to develop. Some patients seem to have a marked idiosyncrasy to dermatitis and to loss of hair. One patient in their series having been burnt by a single exposure to a ray which had been turned twice a week for two years upon another case without even producing redness of the skin. Curiously enough the conjunctival tissue is not nearly so sensitive as the mucous membrane of the lip.

**Some Experience of the Treatment of Inoperable Malignant Disease by Means of the X-Ray.**—A. B. Johnson, of New York, presented the his-

tories of ten cases, nine of carcinoma and one of sarcoma. Of this total eight had died. One, he believed to be markedly improved, and one he felt reasonably sure was cured. He did not speak with great hope as to the future usefulness of this therapeutic measure.

Dr. F. H. Williams, of Boston, said that the rays are probably of very little use after disease has involved a gland; that they are of value probably only in the absolutely superficial growths. He called attention to his fleurometer, by means of which an accurate measure could be made of the amount of rays which were passing from the machine. This ought to be used before employing the rays, so that burns might be avoided.

Dr. W. J. Hearn, of Philadelphia, would operate in every case no matter where it might be situated if it had the least semblance to malignancy, the two solitary exceptions being keloid and rodent ulcer.

Dr. Bevan, in closing, said that there was no excuse for using the rays on anything except absolutely superficial growths, as a postoperative prophylaxis and as an experimental study in non-operable cases.

Dr. Rodman said that undoubtedly the best treatment for epitheliomata and tuberculosis about the face and also occasionally for tuberculous glands was the x-ray. In deeper tissues, however, their action was as yet problematical.

Dr. Johnson said that all operable tumors should be removed, save on the face, when superficial. We do not as yet know the value or the limitation of the x-ray, and particular attention should be paid to an effort not to allow the general public to become possessed of the idea that the rays would cure cancer.—*Medical News.*

## Results of X-Ray Treatment.

N. Y. Academy of Science, Jan. 12, 1903.

Dr. P. R. Turnure read this paper, which was based on observations extending over a period of two years at the New York and Roosevelt hospitals. The total number of cases treated at the Roosevelt Hospital during the last twelve months was ninety-four, but he had been able to follow and keep satisfactory records of eighty-two. He had made use of three different coils, each one more powerful than the preceding. At present he was using a twenty-inch coil, and preferred this one, because the results seemed to be more quickly obtained with it. He had been unable to formulate any general rule about x-ray tubes further than that the resistance should be low, and the tube should be able to carry a large quantity of current without changing its vacuum. An exposure of five or ten minutes was given, and the method preferred was to give the exposures every day for the first week, then every other day for the second week, and then after an interval of two weeks resume the treatment as before. He had had five cases of epithelioma of the nose, all of which had done well. One now under treatment, after eight exposures, showed marked improvement. There were three cases of epithelioma of the lip. One of these had done badly after a vigorous x-ray treatment for fourteen days. The treatment caused deep sloughing. He had had two cases of epithelioma of the penis, one of which only had done well. The general results in all of the epitheliomas were good, and he thought the x-ray treatment was indicated in these before operation. The results were quite different in carcinoma. He had had five cases of carcinoma of the neck, and ten cases of carcinoma of the breast, three of the latter being primary. Two of these were absolutely inoperable. Of the

seven recurrent carcinomata of the breast only one was successful to any extent. All of them, after a short period of improvement, seemed to follow the natural course of the disease. This temporary improvement could be noticed in all cases, and he attributed it solely to the psychic effect of the new treatment. Sometimes this lasted as long as six weeks, and then the disease progressed as before. In one case, to which great attention had been given, the disease spread quite rapidly, the progress of the disease actually seeming to be stimulated by the x-ray. In two cases of sarcoma, one of the limb and the other of the neck, the pain was relieved for a few weeks. He had only treated three cases of tuberculous glands of the neck, and all of these were in children. All of them improved greatly after four weeks of treatment, but all of this improvement he attributed to the good care the children received while in the hospital. Two cases of tuberculosis of the larynx were treated, one for four and the other for six weeks, without any improvement. Two cases of lupus were treated, one for eight and the other for twelve weeks. They appeared to have been cured. Three cases of erythematous lupus were treated. Two did extremely well, tho both of them required over four months' treatment. The third, after seven months of treatment, was only slightly improved. Five cases of chronic eczema of the leg were treated by the x-ray, and all were cured apparently as a result of the irritation produced; nevertheless, the treatment was much slower than other well-known methods. It was worthy of note, however, in this connection, that the itching ceased very promptly after the x-ray treatment. Dr. Turnure said he had treated one woman with the x-ray for the

purpose of removing hair from her face. The treatment had been carried out very cautiously, and after four months the hair had been entirely removed from the area treated without any burning. If this result proved to be permanent, he would treat the rest of her face, because the woman had tried the electrolytic method and had found it very painful.

*Conclusions.*—The results that he had observed in x-ray treatment were certainly confusing, but the first that occurred to him on studying these records was that x-ray treatment, to be successful, must be used upon superficial disease processes. If the x-ray exerted its influence very deeply, it was almost certain that some of these effects would be observed in x-ray workers, which, so far as he knew, was not the case. Glands, which were often secondary to epithelioma, were not really epitheliomatous deposits, but were the results of secondary infection. The speaker said he was extremely sorry to have to report such poor results, for, a year or more ago, he had been very enthusiastic over x-ray treatment. Undoubtedly, many cures were effected in superficial growths. Most of these cures appeared to be permanent, but he had had one recurrence take place eight months after what appeared to be a perfect cure.

Dr. H. Lilienthal said that he had watched some of the cases treated by the x-ray at the hospital. He had, apparently, seen epitheliomata cured, but he had never seen a deep growth cured by the x-ray alone. At present, he had under his care a small round-cell sarcoma of the scapula, which had been proved to be of the malignant type. Thru a generous incision, a piece had been removed for examination. Ordinarily one would not expect this incision to heal, but under the use of Coley's fluid and of the x-ray there had been a gradual flattening of the tumor, the wound had healed promptly, and the skin had become markedly pigmented. Of

course, Coley's fluid was used here, and while there was only one reaction from this, and that might have been accidental infection, she was now taking enormous doses of this fluid without any reaction. This patient had been exposed to the x-ray for fifteen minutes on alternate days. The case had been doing so well that he had not felt called upon to operate. Dr. Coley was of the opinion that his fluid only benefited when it caused a reaction; if this were true, then it might be very properly argued that in this case the good result was due to the x-ray and not to Coley's fluid. While the results reported in the paper were disappointing, it was quite possible that we had been altogether too optimistic regarding this agent; for, as a matter of fact, we knew very little about it. The x-ray treatment at the present time should be reserved for inoperable cases.

Dr. Robert T. Morris agreed with the last speaker that, in this experimental stage, only inoperable cases should be subjected to the x-ray. He had had one case of lupus of the forehead, which was practically well, and a case of epithelioma of the lip in which the cervical glands had been so much involved that he thought operation was not indicated. The latter case was now apparently well. In a case diagnosed as inoperable sarcoma of the parotid, the x-ray treatment had, apparently, produced a complete cure. In another case of very extensive recurrence in the glands of the neck, after amputation of the breast, some improvement had been effected, but the patient had not followed the treatment very closely. He was disposed to feel, as did the reader of the paper, that the x-ray was not of great value where the malignant disease was deeply situated. He had one case of epithelioma of the trigone of the bladder that was being treated by the x-ray by way of the rectum and a suprapubic incision. At last accounts the case was decidedly

better. A very interesting point was, that neoplastic deposits in the glands seemed to disappear under the influence of the x-ray.

Dr. Carl Beck said he was convinced that if sufficient treatment were given to any epithelioma it could be cured, but he also believed this was not so good a method as thru extirpation of the epithelioma by the knife. The x-ray should be reserved more especially for special cases, as, for example, epithelioma of the eyelid, where a particularly good cosmetic result was desired. He had seen a number of cases in which the disease had recurred just as rapidly after x-ray treatment as after operation. Last spring he had presented to a medical society an old man in whom an epithelioma of the upper eyelid had been completely cured by twenty exposures to the x-ray, yet very shortly afterward the disease appeared in the upper lip, showing how widely disseminated were the cancer cells. The use of protective shields was a mistake, because our object should be not only to have the x-ray tube as near as possible, but to secure a wide effect. He had noticed that those who used the x-ray very carefully, in the hope of avoiding burns, were the ones who obtained only indifferent results. It was often well to run considerable risk of burning the patient. He had met with cases in which improvement had only been effected after the use of very strong doses of the x-ray. He would not advise the treatment of carcinoma of the stomach and of the bladder by the x-ray, on the principle that it was unwise to leave for the x-ray what could be done by the scalpel. He believed that there was not a case of lupus that would not yield to the x-ray.

Dr. Thomas H. Manley complimented the author of the paper on his practical and candid treatment of this subject. He thot the paper and the discussion showed clearly that the sphere of x-ray

treatment should be limited to the treatment of lupoid growths. What had been said about the disappearance of glands bore out his own experience, that when the local source of irritation or infection was destroyed the glands would take care of themselves.

Dr. Turnure closed the discussion. He said he wished to make clear the fact that one of the cases, indeed the one that had apparently given the best result, had already recurred. He was not in a position to say at present how many recurrences there would be. The scar on the face from x-ray treatment had been found much less disagreeable than the scar usually left after a cutting operation. His experience had been that the recurrence from operation was greater than from the x-ray. This was his present opinion, although it was quite possible that he might have reason to change that opinion in the near future. The result in the removal of hair from the face was certainly far better than from electrolysis.—*Medical Record*, Feb. 17, 1903.

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**Electrolysis of Silver Nitrate.**—It is generally said that silver nitrate becomes acid during electrolysis, yet Rodger and Watson found that the acidity of the bath diminished. This apparent contradiction has been explained recently by Ledue as being due to a difference of the conditions. With platinum electrodes in a sufficiently concentrated solution, a brown solid, containing a higher oxide of silver, is formed with simultaneous formation of nitric acid, when the bath has a certain concentration; when a sufficient concentration is reached, this reacts on the compound forming oxygen. He finds that corrosion or solution of the kathode deposit does not take place.—*Lond. Elec. Eng.*, November 7.—*Electrical World and Engineer*, Dec. 29, 1902.

### Editorial.

Dr. Robert Newman, the president of the faculty of the New York School of Physical Therapeutics, and associate editor of the *Journal of Advanced Therapeutics*, was born and educated in Germany. In early manhood he came to New York, where he pursued his medical studies at various schools, graduating at the Long Island College Hospital in 1863, and later at Bellevue. Dr. Newman soon became prominent, both as a surgeon and as an earnest and progressive man. Many medical societies elected him to membership, and he has held many positions of responsibility and honor.

In electro-therapeutics Dr. Newman is prominent as the inventor of the electrolytic method of treating strictures, a method which the medical world is slowly coming to recognize as the most perfect yet known; but which makes its way slowly, since it requires in the operator some knowledge of the principles of electrotherapy. In 1886 he devised the galvanocautery sound for the treatment of hypertrophied prostate.

A number of Dr. Newman's published papers have been translated into other languages.

Personally Dr. Newman is the soul of integrity and honor, a gentleman in the best sense of the term, genial and loved by all who know him.

#### Results of X-Ray Treatment.

About a year ago medical journals were filled with reports of the successful treatment of malignant growths by x-rays. Today, while the reports of successful treatment are not less numerous, a very considerable number of failures are reported. This is only what was to be expected. When a new therapeutic process is brot into use only those who have had some measure of success are likely to publish the results of their labors. They are

afraid of criticism. Later, when it is generally recognized that some failures are to be expected, these operators gain courage to report their failures and partial successes as well as their completely successful results. The brilliant reports of some of the earlier x-ray operators were possibly overdrawn. Most men who obtain even a moderate measure of success along entirely new lines are by nature enthusiastic and optimistic.

It is also true that the successes of the earlier x-ray treatments has encouraged experiments on the part of a larger number of physicians and surgeons, many of whom are quite unfamiliar with electricity in general and with the x-ray in particular. Treatments have been carried on by these men in ways which experts would unhesitatingly condemn as useless or dangerous. The idea that such a powerful therapeutic agent as the x-rays have proved themselves to be can be handled with impunity and with any marked degree of success by men who are ignorant of its properties, cannot be too strongly condemned. A cursory glance at the reports of x-ray treatments which are made at our medical associations emphasizes this view. One operator "always uses a low tube"; another prefers a "high tube in all cases"; while a third does not seem to consider the degree of vacuum of the tube as of any importance whatever, and contents himself with the statement that he used "two amperes and 100 volts."

It is still unfortunately true that there is no convenient and accurate way of measuring the quality and intensity of x-rays, so that very much depends upon the skill and experience of the individual worker. But so far as we have been able to examine the reports most of the failures in the treatment of malignant tumors, at or near the surface of the body, have come from two causes: first, ignorance of the

proper method of treatment; secondly, delay in beginning the treatment until systemic infection has taken place. The proportion of successes obtained in treatment by x-ray experts is greater now than it was one or two years ago; and while there are undoubtedly many conditions of malignant tumors in which the x-ray alone will not effect a cure, the value of the x-ray as a therapeutic agent is becoming more and more evident.

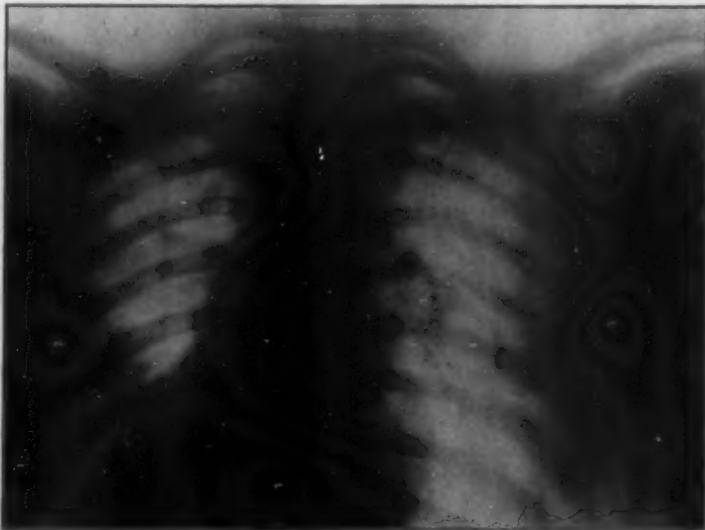
### Radiations

We know that ordinary light consists of electric waves. We know that there is an unlimited number of electric waves which are invisible to our eyes, but which can be detected by photographic or fluoroscopic methods. The recent determinations of the velocity of x-rays, which radiate with the speed of light, and the probable discovery of their refrangibility, has definitely settled the view that x-rays are electrical waves, of the same sort as ordinary light, but very much shorter.

The rays emanating from a Crookes tube are various. The terminals and the outer portion of the tube are subjected

to rapidly alternating electrical stress and give rise to electrical waves of various sorts. Within the tube the kathode stream consists essentially of minute gaseous particles, pieces of atoms probably, called *elektrons*. Along with these particles there are undoubtedly waves of various sorts, some of which may have the power of penetrating the wall of the glass tube. At the anti-kathode and still more at the walls of the tube the energy of the kathode stream is transformed into other types of radiation, of which a small amount appears as ordinary light and a considerable amount as x-rays. Whether any other (unknown) radiations are present in any considerable amount among the x-rays, we cannot, of course, say, but such a thing is not improbable.

On account of their similarity to x-rays the radiations from uranium, radium, etc., have been supposed to be waves. Thomson, however, considers them far more likely to consist of *elektrons*, and thus resemble the kathode stream more than they do the x-rays. It is probable that these radiations are complex, consisting partly of *elektrons* and partly of electric waves.



Mrs. B. X-Ray Picture of Chest of the First Patient Treated for Pulmonary Tuberculosis in Dr. Pratt's X-Ray Laboratory, in April, 1896. Picture taken seven years after treatment. See page 117.

## Correspondence.

*Dear Doctor:*

In your JOURNAL, which has just come to hand, I notice an inquiry as to whether it is necessary to insulate the shaft of a static machine, and that your reply states that it is necessary to insulate it.

I wish to call your attention to the fact that the Wimshurst machines which are made have the circles mounted directly on the brass hubs, also that some of the Toepler machines are made in the same way, and that a Holtz machine can also be made without any insulation whatever on the shaft.

If you will consider the matter carefully, you will see that insulation on the shaft is not a necessity, and has nothing whatever to do with the working of the machine, as there is no material that is a better insulator than the glass plate itself. Hard rubber is used on the shafts of static machines simply to make a comparatively soft surface for the circles to rest on, so that in case the circles get loose so that the shaft revolves without carrying the circles with it, the plate will not be crumbled and cracked as they would if the plates rested directly on the steel shaft itself.

I also notice a letter from a doctor explaining the trouble he has had with the jam nut used to keep the circles tight, and wish to call your attention to the enclosed card which shows our method of keeping the circles tight automatically, so that it is never necessary to have to tighten up the jam nut.

Yours very truly, H. F. WAITE.

[The cut will appear in our next issue.—Ed.]

*Dear Doctor:*

I send \$1.00 for three months' trial order for your paper. I have been looking for something about the removal of hair from face of females with the x-ray. I am comparatively a beginner. I have a fine static machine, am up with the technic for static work and x-ray examination, but I am pressed for the treatment of cancer and skin diseases, and the removal of hair. Can't you tell me in a few words what to expect—am treating this case by throwing the light on the chin and upper lip and the sides of the face for 10 to 15 minutes every other day. I am treating a case of sarcoma of the bony tissue of the nose almost the same way. A specialist removed from the nostril some of the growth and it was

called osteo-sarcoma. I can't throw the light up the nostril sufficient so I let it fall over the nose. The skin is not involved. Is that correct?

I will appreciate a few lines on the technic and I hope you will freely incorporate technic fully in the various issues of the JOURNAL from time to time. That is what we need away from the cities, especially when in general practice. Yours truly, M. M. S.

[To remove hair use a low tube and expose only the parts to be treated for ten minutes each day till the hairs are loosened. Let the tube be six to ten inches from the face, and take care to have the edges of the face-screen in a slightly altered position from day to day. If strong indications of dermatitis appear early, stop treatment till it is under control. When the hairs are loosened decrease the time of exposure one minute each day, or remove the tube one inch further from the face each day for eight or ten days.

If the hairs return the treatment must be repeated. If only a few return they may be removed by the electrolytic needle. Some experience is required to succeed with only one series of exposures, but care must be taken not to make the first doses too strong or the skin may be permanently injured.

Treat the osteo-sarcoma from all sides, internally and externally.—Editor.]

*Dear Doctor:*

I took your course on electricity when I purchased the 24-plate Betz machine, and have been doing quite a good deal of work in that line since.

I see in an article on Albuminuria written by Dr. Neiswanger, that he cures some in 20 or 30 static treatments. He gives "Negative head breeze 15 minutes, then the positive insulated treatment for 15 minutes."

Will you kindly explain fully how to give the "positive insulated treatment" and oblige?

Yours fraternally,

W. P.

[The negative head breeze is given by seating the patient on the insulating platform with his feet on a metal plate which is connected with the positive pole of the static machine, and suspending over his head the crown which is connected with the negative pole. The negative pole may be grounded or not, as you please.]

When the negative pole is grounded remove the crown altogether and you have "positive insulation." It differs from the negative head breeze in being a milder current and in being distributed over the upper part of the body instead of all passing thru the head.—Editor.]

Dear Doctor:

A woman, 28 years old, married seven years, parents healthy, has two children, the youngest six months old nursing mother's milk. About ten months ago she observed some soreness within two-thirds of an inch of the left nipple, which continued three months, when a small, nodulated, hard tumor appeared, which has been slowly enlarging. On first examination (yesterday) I found at a few very small points and a thin milky exudate from the growth. For the last five months she has been having lancinating pains in the left breast. The diseased breast furnishes most of the milk for the babe. This growth is about as large as a hickory nut. There is no swelling in axillary or other glands. She is anæmic, appetite poor.

She has been wearing a tight corset. I sent her to an instrument maker, ordered careful measurement of the breast and a thin hard rubber disk to be made so as to lift pressure from the breast, and prescribed Gardener's Syrup of Hydriodic Acid; bowels to be regulated.

Would you advise removal of diseased portion of breast at once and begin using x-ray subsequently? If so, how soon after extirpation? Would you advise taking a few stitches or leave the wound open? I do not own Minin's ultra violet ray apparatus. Would you have confidence in using fresh made point maple electrode in place of x-ray? In short, please advise me in detail how best to treat this case.

I have treated the family for over forty years

and am anxious to give her the best chance of life.

Thanking you in advance for your trouble, I remain,

Faternally yours,

S. J.

[First use x-rays or the hyperstatic current. If the tumor reduces steadily keep on with the treatment. If not, after three weeks or more excise as you would a non-malignant growth, and after a few days renew x-ray treatment mildly, thru the dressing. Continue treatment tri-weekly, then weekly, for three months.]

The anode breeze from a maple electrode is good but is not so reliable as the x-ray.—Editor.]

### Conduction of Electricity in Flames.

—Lenard (*Ann. d. Phys.*, November 11) gives a description of a phenomenon which he calls "visible wanderings of ions in flames." A Bunsen flame is placed in a horizontal electric field. If now a bead of some salt is brought into the flame, as for spectrum analysis, it is seen that the comet-shaped strip of luminous vapor runs slantingly towards the negative electrode. The "wandering" only sets in when the bead is brought into the interior of the flame. In the outer mantle the vapor ascends vertically. — *Electrical World and Engineer*, Dec. 13, 1902.

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